IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

HANS KRAGL et al ]

For: CIRCUIT BOARD AND METHOD OF MANUFACTURING A CIRCUIT BOARD ]

Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Please amend the claims in the above-identified application as follows:

REWRITTEN CLAIMS IN CLEAN FORM

6. (Amended) The circuit board according to claim 2, characterized in that each individual layer is provided on one functional side with a plurality of protrusions (16) and on the other functional side with a plurality of depressions (16), the protrusions of the one individual layer engaging into the depressions of the other individual layer, so that the two individual layers are precisely positioned in relation to each other.

9. (Amended) The circuit board according to claim 1, characterized in that the conductor trench (12) extends as far as to the edge of the circuit board, so that a plug connector may be connected.

10. (Amended) The circuit board according to claim 9, characterized in that the conductor trench (12) is semicircular in cross section.

11. (Amended) The circuit board according to claim 9, characterized in that the conductor trench (12) is rectangular in cross-section.

12. (Amended) The circuit board according to claim 9, characterized in that a first conductor trench (12) is provided on one of the individual layers (10) and a second conductor trench (12) is provided on the other individual layer (10) and that the two conductor

trenches are located centered opposite each other, one of the conductor trenches having smaller dimensions than the other conductor trench.

14. (Amended) The circuit board according to claim 13, characterized in that the space between the conductor trenches (12) located opposite each other is filled with air.

15. (Amended) The circuit board according to claim 1, characterized in that a cooling groove (20) is provided on at least one of the individual layers, the cooling groove being filled with a metallization (18) of a thickness such that a heat sink is formed.

16. (Amended) The circuit board according to claim 1, characterized in that a cooling channel (34) is provided on at least one of the individual layers, the cooling channel being adapted for a cooling agent (36) to be conducted therethrough, and that the other individual layer covers the cooling channel.

18. (Amended) The circuit board according to claim 1, characterized in that at least one mount (26) for an electronic, optical or optoelectronic component (28) is provided in at least one of the individual layers.

20. (Amended) The circuit board according to claim 1, characterized in that the two individual layers are connected with each other by an electrically conductive material (24).

22. (Amended) The circuit board according to claim 1, characterized in that at least one of the individual layers consists of an optically transparent material and that on this individual layer a waveguide trench (42) is provided which is filled with an optically transparent material the refractive index of which suitably differs from that of the material of the individual layer (10), so that a waveguide (40) is formed.

25. (Amended) A method of manufacturing a circuit board (5), comprising the following steps:

at least two individual layer blanks (110) are produced by formation from a casting, each of the blanks being provided with positioning formation preforms (116) on first and second functional sides;

the individual layer blanks (110) are subjected to a pretreatment on their entire surface such that they can be provided with a metallization;

in those regions which are not intended to be provided with a metallization, the surface is subjected to a subsequent treatment, so that no metallization is deposited in these regions;

a metallization (18) is applied to the regions which have not been subjected to a subsequent treatment;

the individual layer blanks are placed on top of one another and at the same time precisely positioned in relation to each other by means of the positioning formations (16).

30. (Amended) The method according to claim 29, characterized in that the individual layers (10) are injection-molded.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

6. (Amended) The circuit board according to claim 2 [and claim 4], characterized in that each individual layer is provided on one functional side with a plurality of protrusions (16) and on the other functional side with a plurality of depressions (16), the protrusions of the one individual layer engaging into the depressions of the other individual layer, so that the two individual layers are precisely positioned in relation to each other.

9. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that the conductor trench (12) extends as far as to the edge of the circuit board, so that a plug connector may be connected.

10. (Amended) The circuit board according to [any of the preceding claims] claim 9, characterized in that the conductor trench (12) is semicircular in cross section.

11. (Amended) The circuit board according to [any of claims 1 to 9] claim 9, characterized in that the conductor trench (12) is rectangular in cross-section.

12. (Amended) The circuit board according to [either of claims 19 and 11] claim 9, characterized in that a first conductor trench (12) is provided on one of the individual layers (10) and a second conductor trench (12) is provided on the other individual layer (10) and that the two conductor trenches are located centered opposite each other, one of the conductor trenches having smaller dimensions than the other conductor trench.

14. (Amended) The circuit board according to [either of claims 12 and 13] claim 13, characterized in that the space between the conductor trenches (12) located opposite each other is filled with air.

15. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that a cooling groove (20) is provided on at least one of the individual

layers, the cooling groove being filled with a metallization (18) of a thickness such that a heat sink is formed.

16. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that a cooling channel (34) is provided on at least one of the individual layers, the cooling channel being adapted for a cooling agent (36) to be conducted therethrough, and that the other individual layer covers the cooling channel.

18. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that at least one mount (26) for an electronic, optical or optoelectronic component (28) is provided in at least one of the individual layers.

20. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that the two individual layers are connected with each other by an electrically conductive material (24).

22. (Amended) The circuit board according to [any of the preceding claims] claim 1, characterized in that at least one of the individual layers consists of an optically transparent material and that on this individual layer a waveguide trench (42) is provided which is filled with an optically transparent material the refractive index of which suitably differs from that of the material of the individual layer (10), so that a waveguide (40) is formed.

25. (Amended) A method of manufacturing a circuit board (5), [in particular according to any of the preceding claims,] comprising the following steps:

at least two individual layer[s] blanks (110) are produced by formation from a casting, each of the blanks being provided with positioning formation preforms (116) on first and second functional sides;

the individual layer blanks (110) are subjected to a pretreatment on their entire

surface such that they can be provided with a metallization;

in those regions which are not intended to be provided with a metallization, the surface is subjected to a subsequent treatment, so that no metallization is deposited in these regions;

a metallization (18) is applied to the regions which have not been subjected to a subsequent treatment;

the individual layer blanks are placed on top of one another and at the same time precisely positioned in relation to each other by means of the positioning formations (16).

30. (Amended) The method according to [any of claims 25 to 29] claim 29, characterized in that the individual layers (10) are injection-molded.